

Listing of the Claims:

The following is a complete listing of all the claims in the application, with an indication of the status of each:

- 1 1. (Original) A method for determining the refractive index and/or
2 compensation of the influence of refractive index during interferometric
3 length measurements with the aid of an interferometer (13, 13') to which
4 there are applied at least two measuring beams (v_2 , v_3) having at least
5 defined frequencies approximately at a harmonic ratio to one another, and
6 at whose output phases for the at least two measuring beams (v_2 , v_3) are
7 evaluated, the interferometric phases being multiplied in an
8 interferometrically fashion corresponding to the harmonic ratio of the
9 frequencies of the measuring beams (v_2 , v_3) and at least one phase
10 difference of the phase values thus formed being examined, characterized
11 in that at least one of the measuring beams (v_3) is of variable frequency,
12 and in that from the phase difference formed a control signal is formed in
13 order to vary the frequency of the variable frequency measuring beam (v_3)
14 and is used to control the frequency such that the phase difference
15 vanishes.
- 1 2. (Original) The method as claimed in claim 1, characterised in that at
2 least one reference beam (v_1) is generated at a frequency that corresponds
3 approximately to the frequency of one of the measuring beams (v_3) and is
4 coupled to the frequency of another measuring beam (v_2), and in that a
5 frequency difference is measured between the frequency of the reference
6 beam (v_1) and the frequency of the corresponding measuring beam (v_3).
- 1 3. (Original) The method as claimed in claim 2, characterized in that one
2 of the measuring beams (v_2) and the reference beam (v_1) are generated by
3 a coherent radiation source (L1) with a frequency multiplier.

1 4. (Previously Presented) The method as claimed in claim 1, characterized
2 in that the two measuring beams (v_2 , v_3) are derived from a beam of a
3 coherent radiation source (L1) by means of a frequency splitter (36).

1 5. (Previously Presented) The method as claimed in claim 1, characterized
2 in that high frequencies (Ω , 2Ω) that are at the same harmonic ratio to one
3 another as the frequencies of one of the measuring beams (v_2) to the
4 reference beam (v_1) are modulated onto the superimposed measuring
5 beams (v_2 , v_3) in a reference branch of the interferometer (13').

1 6. (Previously Presented) An interferometer arrangement for carrying out
2 the method as claimed in claim 1, having at least one coherent radiation
3 source (L1, L2) for generating at least two measuring beams (v_2 , v_3)
4 having defined frequencies approximately at a harmonic ratio to one
5 another and having an interferometer (13, 13') whose output signals are
6 passed to a beam splitter (DST 13, DST 22, DST 32,) separating the
7 measuring beams, the separated measuring beams being passed to
8 optoelectronic transducers (PD12, PD13; PD22, PD23; PD32, PD33), and
9 at least one of the output signals the optoelectronic transducers being fed to a
10 multiplier (16, 22, 32) corresponding to the harmonic ratio of the
11 frequencies of the measuring beams (v_2 , v_3), characterized in that the
12 frequency of at least one of the measuring beams (v_3) can be varied by
13 means of a frequency controller (18, 23, 35), and in that a phase
14 comparator (17, DBM) for the phases of the output signals of the
15 optoelectronic transducers (PD12, PD13, PD22, PD23, PD32, PD33) is used
16 to generate a control signal representing a phase difference, which control
17 signal is fed to the frequency controller (18, 23, 35) to form a control loop
18 for the interferometric phases (ϕ_2 , ϕ_3).

1 7. (Original) The interferometer arrangement as claimed in claim 6,
2 characterized in that the coherent radiation source (L1, L2) is designed to
3 generate at least one reference beam (v_1) whose frequency corresponds
4 approximately to the frequency of one of the measuring beams (v_3) and is
5 harmonically coupled to the frequency of another measuring beam (v_2).

1 8. (Previously Presented) The interferometer arrangement as claimed in
2 claim 6, characterized by a frequency multiplier assigned to a coherent
3 radiation source (L1, L2).

1 9. (Previously Presented) The interferometer arrangement as claimed in
2 claim 6, characterized in that use is made in a reference branch of the
3 interferometer (13, 13') of a frequency modulator (30) whose controller is
4 connected to a high frequency generator for two high frequencies (Ω , 2Ω)
5 whose frequency ratio to one another is that of the frequencies of the
6 measuring beams (v_2 , v_3).